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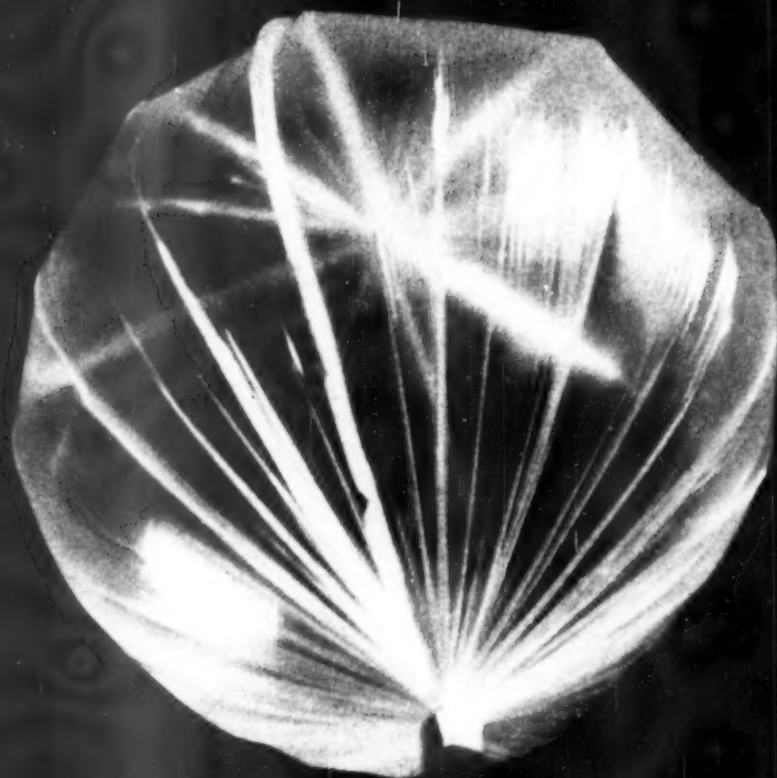
VOL. 74 NO. 13

PAGES 223-240

SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE



Hurricane Balloon

See Page 227

A SCIENCE SERVICE PUBLICATION

A Special Message to the Readers of Science News Letter

In order to improve our service to the public we ask you to join us and help plan a program of research activities by answering a few questions. These are designed to guide our engineering department in creating new equipment which will assist teachers, scientists and parents as well as scientific amateurs in their work.

For your cooperation we are making available a special pre-release announcement of new products at prices 20%-50% below the nationally advertised. To be eligible for these announcements be sure to validate the form at the bottom of the page after you have filled in the questionnaire.

1. What new scientific equipment or kits would you like to see available?

2. Are there special scientific toys or books you would like for your children? Please list.

3. In the following boxes check those subjects that interest you. Put a number to indicate order of preference if any.

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<input type="checkbox"/> Biology	<input type="checkbox"/> Kit building	_____
<input type="checkbox"/> Chemistry	<input type="checkbox"/> Exploring	_____
<input type="checkbox"/> Physics	<input type="checkbox"/> Geology	_____
<input type="checkbox"/> Archaeology	<input type="checkbox"/> Rocketry	_____

4. Would you like to know more about the education of gifted children? ☐ Yes ☐ No

5. If answer to 4 is yes which particular areas would you want to know more about:

<input type="checkbox"/> Selection of schools	<input type="checkbox"/> Books	<input type="checkbox"/> Toys	<input type="checkbox"/> Games
<input type="checkbox"/> Guiding extra-curricular activities			
<input type="checkbox"/> Other scientific equipment			

6. Did you buy scientific equipment in 1958?

☐ Yes ☐ No

What did you buy?

7. Do you intend to make purchases soon? ☐ Yes ☐ No
What?

8. (Optional) Your occupation

<input type="checkbox"/> Professional scientist specialty	<input type="checkbox"/> Student
<input type="checkbox"/> Physician	<input type="checkbox"/> Other (explain)
<input type="checkbox"/> Teacher	_____
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9. Are you interested in special reports on new equipment?
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ASTRONAUTICS

"COSPAR" in Operation

Scientific studies of space will soon be aided by the establishment of an international committee to guide research and planned projects.

► AN INTERNATIONAL committee on space research (COSPAR) to plan scientific studies made with rockets, satellites, and space, lunar and planetary probes is now functioning.

The Eighth General Assembly of the International Council of Scientific Unions (ICSU), the first to be held in the Western Hemisphere, approved the recommendation of its Executive Board in setting up COSPAR.

The 15 members of COSPAR will include the nations that have launched satellites, the United States and Russia, and Great Britain which is expected to attempt hurling a satellite spaceward shortly. There will also be delegates selected from the nations where satellite observing stations are located. Eight members are expected to represent the interested international scientific unions, such as the International Astronomical Union.

COSPAR has until Dec. 31, 1959, to coordinate space research and recommend future steps. It will cooperate with the United Nations in problems of regulation and control of space affecting scientific activities. It will have no authority to make political decisions.

One of COSPAR's first actions is expected to be the establishment of a code of conditions for landing objects on the moon or planets to keep damage at a minimum from the scientific point of view.

Dr. Lloyd V. Berkner, president of ICSU and also president of Associated Universities, Inc., New York, and Sir Harold Spencer Jones, ICSU secretary-general and Great Britain's former astronomer royal, outlined

the expected activities of COSPAR at a news conference at the National Academy of Sciences. One of COSPAR's activities, not part of the International Geophysical Year program also sponsored by ICSU, will enable scientists of countries without satellites to place their experiments in satellites of launching nations.

No offers of such international cooperation have yet been made by the United States or Russia, but Dr. Berkner said he anticipated they would make payload space available.

The ICSU General Assembly is also expected to approve the establishment of a special committee on oceanic research (SCOR) and a special committee on Antarctic research (SCAR). Each will continue present international cooperation in these fields after the end of the International Geophysical Year on Dec. 31.

One important SCOR project will be an intensive study of the Indian Ocean during 1962-63 by more than 20 ships representing at least that number of countries. The Indian Ocean was selected for a variety of reasons, Dr. Berkner said, one being that it is the simplest one in which to study the effect of winds on currents. The energy transferred from the wind to the ocean can be measured more easily there than anywhere else on earth, scientists have concluded.

SCOR will cooperate closely with the special committee on Antarctic research in this study, since the Indian Ocean touches only one other, the Antarctic.

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very low temperatures the electrical resistance of uranium-molybdenum and uranium-niobium alloys.

Contrary to all known alloys, these had an electrical resistance that became progressively larger as the temperature was decreased down to about two degrees above absolute zero, when they became superconductors. Dr. Hulm said the superconductivity was also surprising in view of the rise in electrical resistance preceding it.

To probe more deeply into the superconducting behavior of uranium alloys, the Westinghouse scientists then studied a group of "intermetallic compounds," formed when uranium is combined with such metals as aluminum, manganese, iron, cobalt and nickel. It was from these studies that the new superconductors were discovered.

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METEOROLOGY

Balloon-Borne Radio in Hurricane Succeeds

See Front Cover

► A BALLOON-borne high frequency radio transmitter is definitely feasible as a way of automatically tracking hurricanes, the U. S. Weather Bureau reported.

Signals from the second balloon dropped into Hurricane Helene have been successfully received and tracked by aircraft. (See SNL, Oct. 4, p. 211.)

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the balloon carrying a radio transmitter or the hurricane beacon, in flight.

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PHYSICS

Find New Superconductors

Superconductors containing uranium alloyed with metals have been found that may provide material for new electrical and electronic devices.

► FOUR superconductors containing uranium, the fuel of nuclear reactors, have been discovered by scientists at the Westinghouse Research Laboratories, Pittsburgh.

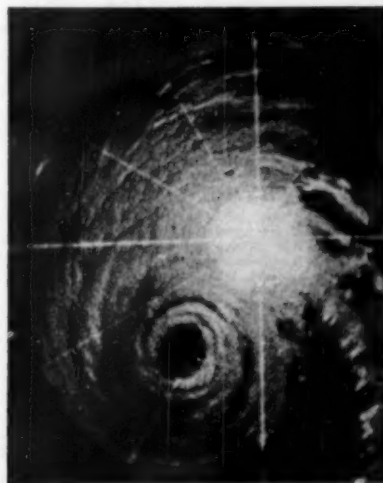
Superconductors are so called because they have the remarkable property of allowing an electric current, once started, to flow seemingly forever in undiminished strength. Superconductivity, discovered by K. Onnes in 1911, has been studied intensively but is still not wholly understood. It occurs only at temperatures near absolute zero, 459.7 degrees below zero Fahrenheit, as far as is known.

The new superconductors were found by

Drs. B. S. Chandrasekhar and J. K. Hulm during research on the electrical resistance of uranium alloys at temperatures near absolute zero. Two of them are the first superconductors yet known to contain manganese and iron, two elements previously considered "death" to superconductors.

If superconductivity could be made to occur at reasonably high temperatures, Dr. Hulm predicted that electrical and electronic devices not now even visualized would become available, and the practices and products of these industries would be revolutionized.

The Westinghouse scientists measured at



HURRICANE EYE—White spiral rain bands surround the eye of Hurricane Helene when it was located (Sept. 27) about 75 miles southwest of Cape Hatteras and about 15 miles southeast of Cape Lookout, N. C. The eye, as shown in this "remarkable radarscope photograph," was 25 miles in diameter. North is at the top of the photograph.

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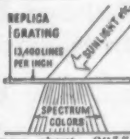
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RADIO

Saturday Oct. 18, 1958, 1:35-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Peyton Rous, member emeritus Rockefeller Institute for Medical Research, New York, and Albert Lasker Award Winner 1958 will talk on "The Life History of a Cancer."

SCIENCE NEWS LETTER

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MEDICINE

Use Frozen Blood

A new technique has been developed that seems to have solved the problems involved in using whole blood that has been preserved by freezing.

► A SUCCESSFUL method of recovering whole blood from the frozen state that holds promise for an end to the chronic blood supply shortage has been reported.

The problems involved in using blood that has been frozen include the removal of glycerol, a preservative, from the blood, avoidance of contamination, and transfusion to recipients without harmful effects. This has been accomplished by a team of scientists who report their technique in the *Journal of the American Medical Association* (Sept. 27).

Frozen blood is stored in glycerol solution at minus 80 degrees and minus 120 degrees centigrade.

Researchers had been working on a sterile method of recovering blood from the glycerol solution with little success previously. Either the blood recovered was not usable, due to the amount of glycerol that could not be removed, or contamination interference.

The reporting scientists processed the blood in a fractionator, added glycerol and froze it. After storage at minus 80 degrees or minus 120 degrees centigrade, the blood was thawed and then deglycerolized in wash solutions.

The blood was then stored for from three to 11 days in a standard refrigerator, the investigators, Drs. James L. Tullis, Hugh M.

Pyle, Robert B. Pennell, Melvin M. Ketchel and John G. Gibson II and Robert J. Tinch, of Harvard Medical School and New England Deaconess Hospital, Boston, and Dr. Shirley G. Driscoll of Children's Memorial Hospital, Chicago, report.

They said the recovered blood appeared therapeutically comparable to the blood that is now used for transfusions.

The advantage of an effective method of preserving blood can eliminate the restricting 21-day limit that is now the legal length of time that donated blood can be used after it is received from the donor. Under the 21-day restriction, blood shortages occur because not enough can be kept on hand. With the frozen technique, large quantities of blood can be stored indefinitely. One bottleneck in the frozen storage procedure that still remains, however, is the scarcity of freezing space for such large quantities of blood.

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GERIATRICS

100-Year Life Possible From Ten-Point Plan

► A TEN-POINT "do-it-yourself" health program may help a person live to be 100.

The program is designed to make it pos-

sible for the average American to live a longer, healthier and happier life. It was put forth by Dr. Edward L. Bortz, Philadelphia, a member of the American Medical Association's Committee on Aging, and consists of these basic needs for older persons:

1. A balanced diet including more protein, vitamins and fluids; less fats and calories.
2. Regular elimination of waste products.
3. Adequate rest of both mind and body.
4. Pursuit of interesting and specific recreational activities.
5. A sense of humor (the best antidote for tension, Dr. Bortz said).
6. Avoidance of excessive emotional tension that leads to personal ineffectiveness.
7. Mutual loyalty of friends and family.
8. Pride in a job.
9. Participation in community affairs.
10. Continued expansion of knowledge, wisdom and experience.

The major scourges of aging man are largely the result of faulty diet, flabby bodies from poor hygiene, excessive fatigue and aimless living, the committee on aging reported.

The two major elements in prolonging life are the preservation of energy and a high degree of motivation. When the incentive, the zest for living, is lost, senility is inevitable, Dr. Bortz explained.

If you just sit and wait for death to come along, you will not have long to wait, Dr. Theodore G. Klumpp, president, Winthrop Laboratories, New York, added.

Continued research in the fields of the major death diseases, cancer and heart ailments, plus a program to reduce the abuse of the human body should enable an increasing number of Americans to become centenarians, Dr. Bortz said.

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METALLURGY

Sputtering Method May Create Printed Circuits

► CATHODE METAL sputtering may prove a good way to produce precision printed circuits for modern communication equipment and giant electronic computers.

Entire circuits, including resistors, capacitors and leads, may be laid down by this technique, in which ionized gas molecules bombard a cathode, dislodging atoms of metal that then redeposit on nearby surfaces.

Harold Basseches of Bell Laboratories has produced thin films of a number of electrically interesting, high melting point metals. Tantalum and titanium, for example, melting at 3,000 and 1,670 degrees centigrade respectively, can be laid down in films that show sufficiently high resistivity to be useful as resistors in printed circuits.

With proper masking of the substrate, lines and patterns of virtually any desired shape and size can be formed, ranging in width down to a few mils. The sputtered films are between a few hundred and a few thousand angstroms thick. Alloys can also be sputtered.

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"SPUTTERED" FILMS—Harold Basseches of Bell Telephone Laboratories (left) describes some of the properties of a newly sputtered film resistor to R. W. Berry. Sputtering apparatus can be seen in the background.

PUBLIC HEALTH

FTC Hearings Set

► A PRELIMINARY hearing of the Federal Trade Commission's charges against six antibiotics manufacturers has been set for Oct. 17. (See SNL, Aug. 16, p. 102.)

The hearing had been scheduled to take place in New York on Oct. 1 at the time the charges were issued to the drug companies in August. A pre-trial conference has already been held dealing with procedural matters.

The purpose of the Oct. 17 hearing is to determine if the drug companies involved will produce the records requested by the attorneys representing the FTC. Legal action may have to be taken to secure them.

Hearings on the merits of the complaints by the FTC are expected to begin near the first of next year. At the conclusion of these hearings the examiner, Frank Hier, will decide whether or not a legal case exists against the drug firms. This is not a final decision of the FTC. Either side can appeal the examiner's decision.

To date, two of the firms have formally denied the charges. All six informally denied the charges shortly after they were issued.

The charges include price fixing and monopolistic practices against American Cyanamid Company, Bristol-Myers Company and its subsidiary, Bristol Laboratories, Inc., Chas. Pfizer & Co., Inc., Olin Mathie-

son Chemical Corporation and the Upjohn Company.

Pfizer was charged with obtaining a patent for the manufacture of tetracycline by making false, misleading and incorrect statements to the U. S. Patent Office. The Patent Office is of the opinion that the patent in question was granted upon investigation and information that met specifications to the satisfaction of the Patent Office.

The FTC charges were issued at the conclusion of a two-year study of the antibiotics industry. As the FTC Bureau of Economics investigation neared completion, the FTC launched an investigation into the practices of individual companies.

Some of the subjects for consideration at the hearings will probably include the question of whether or not other drug companies have been prevented from entering the antibiotic field through the alleged monopolistic practices of the six firms on trial; justification for the patent in question when FTC investigators charge that the process does not warrant a patent; proof that the patent was granted on the basis of misleading information submitted to the Patent Office and price control of antibiotics among those firms involved.

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ROENTGENOLOGY

Stop Heart for X-Rays

► A PROMISING new X-ray procedure that involves actually stopping the heart to obtain more accurate films of coronary arteries was outlined by three Philadelphia doctors.

The procedure, as yet attempted on experimental animals only, was described before the 59th annual meeting of the American Roentgen Ray Society in Washington by Drs. J. Stauffer Lehman, Randal A. Boyer and Fred S. Winter, all of Philadelphia.

The technique consists of "arresting" the heart to allow more effective placement of the opaque material that is used to outline the artery, thus producing a more definite image. The heart is stopped momentarily by injecting a drug, acetylcholine, into an arm vein, Dr. Lehman said.

At present, the pumping action of the heart "washes out" much of the opaque substance, producing a less desirable image.

The potential dangers of such a procedure are as yet to be determined, the doctors pointed out. But their experience would suggest that the procedure may be of considerable worth in making satisfactory films of the coronary arterial system. Besides overcoming the possible dangers involved in such a procedure, after perfection of the technique itself is achieved, there will still be the problem of interpreting the images produced, the doctors commented.

Two Ann Arbor, Mich., radiologists, Drs.

E. Boblitt and Melvin M. Figley, recommended caution in the use of an X-ray procedure for studying the main abdominal artery. The procedure involves insertion of a needle into the back and into the aorta, the main trunk artery of the abdomen. An opaque substance is injected through the needle to outline the aorta while X-ray films are taken.

One complication that arises from this procedure is the fact that sometimes the opaque substance is forced between coats of the artery, "dissecting" or separating them. This diagnostic procedure is not harmless because serious complications from it have appeared from time to time and are continuing to occur, the scientists said.

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CHEMISTRY

Brain Chemical Linked To Vitamin Deficiency

► A SIMPLE chemical compound that is found only in the brain and spinal cord is now suspected to be involved in the epileptic-like seizures associated with vitamin B-6 deficiency.

The chemical is gamma aminobutyric acid (GABA). Dr. Eugene Roberts, chairman of the department of biochemistry, City of Hope Medical Center, Duarte, Calif., established in 1950 that GABA is formed

from glutamic acid. This is a chemical long thought to have a special role in brain function.

Subsequent work by Dr. Roberts has shown that a normal amount of GABA in the brain is dependent on the balance between its rate of formation and the rate at which it is used by nerve cells. A dietary deficiency of vitamin B-6, or a disturbance of the function of the vitamin in the body by chemicals, leads to a slower rate of formation of GABA and a consequent decreased amount in the brain, Dr. Roberts reported at a symposium on "Biochemistry of the Brain" at the American Chemical Society meeting in Chicago.

So far, various attempts have failed to increase GABA levels in the brains of normal laboratory animals by treatment with drugs, or by injection or feeding of the chemical. GABA does not appear to enter the brain readily from the blood stream.

GABA is unevenly distributed in various parts of the brain, Dr. Roberts reported. There were ten-fold differences in the level of the chemical in different areas of the organ.

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PSYCHOLOGY

Rational Psychotherapy Cures One Homosexual

► HOMOSEXUALITY can be cured by "rational psychotherapy", Dr. Albert Ellis, a New York psychologist, explained to the meeting of the American Psychological Association in Washington.

"Rational psychotherapy" is based on the idea that neurotic feelings and behavior as well as all the most significant human emotions and behavior stem from basic assumptions, beliefs or philosophies which the individual holds.

In this therapy, the patient must be shown that he is bolstering his irrational beliefs by continually re-indoctrinating himself with his nonsensical philosophies. De-propagandization is taught by the therapist.

In a case described to the psychologists, the young male patient had been taught by his parents and others in his childhood that he might be rejected by any attractive girl and that this would be a crushing, terrible thing.

Now, as a young man of 35, he kept bolstering this fear of rejection and humiliation and continued to avoid all girls and women.

In treating the young man, Dr. Ellis said, he made no attempt to make him give up his homosexual desires or activities. Instead, he made a direct attack on his irrational fear of approaching girls.

The patient was so improved by the therapy that he stopped it after 19 sessions. Now, after three years, he is not only happily married, but he is teaching zoology in a Midwestern university and getting along well in his profession.

His deviated pattern of homosexuality was completely changed in the course of therapy, Dr. Ellis reported, and he became a "virtually 100% heterosexually oriented individual."

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PSYCHOLOGY

Technology Affects Family

➤ MODERN TECHNOLOGY is seriously affecting the mutual life of families today in "three areas of significant impact," Dr. Joost A. M. Meerloo, New York psychologist and psychiatrist, said.

He called for an awareness of these encroachments "on our happiness and peace of mind" in order to "maintain peace and understanding within the family, the basic unit and nucleus of all social harmony."

In a talk at the North Shore Hospital, Chicago, on emotional forces in the family, he said the disrupting factors include the "technical invasion," the "invasion by psychological concepts," and the "invasion by the confusing semantics of love."

The technical invasion Dr. Meerloo describes as the coercive action of the new means of communications, such as television, leading to an unobtrusive change in family relations. One illustration of this is television apathy, the unwillingness of the child to have personal relations other than with the "spell-binding, fascinating TV screen." Dr. Meerloo said he had seen children between four and six years of age who could communicate with the TV screen but not with their parents.

A change in the dinner pattern is another example of the intrusion of the technical age, a modern household being dominated by schedules of every member of the family. Buses, schools, commuter trains also inter-

fere with the quiet breakfast gathering of the family, especially when the mother also has an outside job.

The "invasion by psychological concepts" results from the lack of reserve and privacy coming from misunderstood popularization of psychological concepts and the way persons use "psychologizing" in an aggressive way.

The "invasion by the confusing semantics clinically illustrated by the overemphasis on sexual orgasm, the misjudgment of marital jealousy and a lack of mutual commitment.

The "invasion by the confusing semantics of love," according to Dr. Meerloo, "calls attention to the precocious imprints on sensitive minds of over-glamorized concepts of eternal love, leading to confusion of marital attitudes, lack of loving tolerance and difficulties in mutual adjustment."

Science News Letter, October 11, 1958

SURGERY

Cost and Number of Operations Increase

➤ THE NUMBER of surgical operations performed in the United States is increasing, and so is the cost.

The increase in frequency of surgery is attributed to the increased knowledge of the nature of surgical expense insurance and

the availability of its benefits; broadened coverage in the policies themselves, and improvements in surgery and the development of new surgical techniques, Morton D. Miller, vice-president of the Equitable Life Assurance Society, reported.

A new survey of group surgical claims, made in 1957, has been compared with a similar survey of 1947 and presented at the meeting of the Society of Actuaries in New York.

The increased attention to cancer prevention and diagnosis has resulted in more surgery with respect to benign tumors, cysts, skin suturing and body cavity examinations. In addition, the development of heart operations since the 1947 study has increased the total.

On the other hand, substantial reductions in tonsillectomies, appendectomies and hysterectomies have occurred within the past decade, Mr. Miller said.

Surgical charges have shot up 26% in the ten-year span studied. Highest charges in the recent report were found in Pacific coast states. Obstetrical charges on the Coast were 40% over the national average while non-obstetrical were 21% higher than the national average.

Among metropolitan areas, New York City led all others with a 54% increase over the national average for obstetrical and 48% for non-obstetrical charges, but Los Angeles, San Francisco, Seattle, Washington, D. C., and Chicago followed closely.

Group surgical expense insurance on Jan. 1 of this year covered 50,000,000 persons through some 200 companies. More than 109,000,000 persons are covered by some type of surgical and obstetrical insurance for doctor's charges.

The survey of 1957 covered more than 150,000 claims, selected on a sampling basis from the files of ten life insurance companies that underwrite two-thirds of group surgical expense insurance in the U. S.

Science News Letter, October 11, 1958

PUBLIC HEALTH

Most U. S. Residents Have Hospital Nearby

➤ MOST residents of the United States have ready access to a nearby hospital.

The number of persons to whom hospital services are not easily available has dropped from 10,000,000 to 2,800,000 since 1948, the U. S. Public Health Service reports. Even in the most rural areas, only a small percentage of the population is now without nearby hospital facilities.

This and other evidences of progress in Hospital planning and construction are indicated in a publication, "The Nation's Health Facilities—Ten Years of the Hill-Burton Hospital and Medical Facilities Program, 1946-1956," issued by the Public Health Service. The report includes a summary of the program to Jan. 1, 1958.

During the first ten years 3,047 projects were approved for construction, including general hospitals, nursing homes, treatment centers and laboratories. Of the total cost of \$2,500,000,000, the state and local share was about \$1,700,000,000, the rest being provided by the Federal Government.

Science News Letter, October 11, 1958



FLYING "ROAD MAP"—A cockpit chart with automatic stylus marks a helicopter's position over the East River, New York City, in a demonstration of a new electronic navigation aid by Capt. Irwin J. Kersey, deputy program manager for the Airways Modernization Board. The precise navigational system, called the Bendix-Decca Navigator, was developed by Bendix Aviation Corporation. "Air lines" similar to roads are automatically drawn on electronically controlled maps. Radio stations transmit the direction "lines" displayed on the chart.

ENDOCRINOLOGY

Pancreas Implant Aids Diabetic Hamster

► GRAFTED pancreas glands temporarily "cured" diabetic hamsters, a team of scientists reports.

For the first time a pancreas, transplanted to the cheek pouch of a diabetic hamster, has been tested for its curative powers.

Not only did the transplants "take" and grow, but the pancreases of the diabetic animals returned to normal within two weeks after the transplants were made.

A group of hamsters, approximately two months old, received doses of alloxan, a compound that tends to destroy the islet cells of the pancreas, thus producing diabetes. Hamsters showing high blood glucose levels at the end of one month were used as hosts. They were implanted with pancreases taken from new-born animals four to six hours after birth. A control group of non-diabetic animals also received pancreas implants.

Among the diabetics, 90% of the transplants "took" while only 75% took in the normal animals. E. L. House, C. Burton, H. Cooper and E. Anderson of the department of anatomy, New York Medical College, also report that the implants grew 30% larger and lasted 50% longer in the diabetic hamsters.

Analysis of the blood glucose of the diabetic animals showed that it had returned to normal within two weeks after the endocrine gland graft had been made, the scientists report in *Endocrinology* (Sept.).

The most interesting finding, they conclude, is that the pancreases of all the diabetics in which the grafts lasted two weeks had returned to normal, with essentially normal islets.

The islets, or islands of Langerhans, are groups of cells in the pancreas that produce insulin.

Science News Letter, October 11, 1958

PUBLIC HEALTH

Retarded Child Programs Expand From 4 to 44

► EFFORTS to understand the causes of and care for the mentally retarded child have mushroomed from four state programs three years ago to 44 such programs today.

In 1955, four states were pioneering in the mental retardation problem. These states were receiving only \$141,000 in special project money advanced by the Children's Bureau of the U. S. Department of Health, Education and Welfare, Mrs. Katherine B. Oettinger, chief of the bureau, said.

In 1956, the Federal Government earmarked \$1,000,000 annually for state mental retardation projects. A major goal of the fund was to close the gap between early detection and treatment of mental retardation in pre-school children.

Several of the state programs that are supported by Federal funds are training future physicians in the diagnosis and treatment of various forms of mental retardation.

Some of the state projects are located in

university medical centers. Some, as in Minnesota, Maine, Georgia and Idaho, are concentrated in rural counties in an effort to determine both the need for services and the available resources that can be developed. In Florida, Colorado, Alaska and Massachusetts, the emphasis is on how to integrate mental retardation programs into the services of local health departments.

Clinical services offered at some projects aid practicing physicians who can then use the services for the evaluation of young patients.

Most of the children seen in these projects are of pre-school age. Determination of the nature and degree of mental retardation, and the causes, is the first point of assistance. Consideration is given to physical conditions that, if improved, would lessen the handicap. The family situation affecting the child's condition is carefully studied and resources in the community to aid the child are sifted.

Science News Letter, October 11, 1958

METEOROLOGY

Expand Warning System Against Huge Sea Waves

► HUGE DEADLY sea waves, spawned by submarine earthquakes, are being spotted by an expanded warning system that now covers virtually the whole Pacific area.

The addition of the Fiji Islands, Chile and Australia as cooperating members of the system was announced by Rear Admiral H. Arnold Karo, director of U. S. Department of Commerce's Coast and Geodetic Survey.

The warning system was developed by the Survey after a seismic sea wave, or tsunami, had ripped into the Hawaiian Islands in April, 1946, killing 170 persons and causing \$25,000,000 in damage.

The nine seismograph stations and 24 tide stations of the system are located on the west coast of the United States, in Alaska, the Hawaiian Islands, Peru, Japan, the Philippine Islands and some Pacific islands, as well as the three new areas. Success of the warning facilities depends on the rapidity of communications between stations. The waves travel across the open ocean at speeds up to 600 miles per hour and can strike an area 2,500 miles from their point of origin in as little as four and a half hours.

The warning system works on the following basis:

After a large earthquake, the seismograph stations rush their detection data to the Honolulu headquarters. The earthquake center is located and warnings of a possible sea wave with the expected time of arrival are transmitted. In addition, the widely scattered tide station observers check their gages for unusual sea activity.

Seismic sea waves are commonly and incorrectly called "tidal waves." They are not related to tides, nor are they single huge waves. They roll across the ocean in series up to 20 minutes apart, and the first wave is seldom the largest. Crests, six or seven feet at the highest, race unobserved past ships in deep water, then pile up in the shallow water and crash against the shore as waves as much as 100 feet high.

Science News Letter, October 11, 1958

IN SCIENCE

ENGINEERING

Materials May Resist Damage by Raindrops

► BOTH RUBBERY and rigid materials can withstand the bullet-like onslaughts of raindrops smashing against aircraft.

This was shown by an analysis at the National Bureau of Standards of tests to determine how raindrops erode various materials. The problem of erosion damage to objects that fly at high speed into rain becomes increasingly serious as flight velocities increase.

Dr. Olive G. Engel of the Bureau, in research sponsored by the Wright Air Development Center, analyzed the behavior of waterdrops, lead pellets and steel spheres when they smash against a sheet of soft aluminum and other materials.

The stresses that are produced when a liquid drop collides with a solid surface result from the impact pressure and the subsequent outward circular flow of the drop. Dr. Engel found that a rain-erosion resistant material may be either soft and rubbery, or hard and rigid.

One factor important in analyzing the damage produced by a high-speed waterdrop colliding with a plastic sheet is that it behaves like a hard sphere or pellet, forming a cup-shaped cavity in the plastic.

Dr. Engel reported the raindrop research in the *Journal of Research of the National Bureau of Standards* (July).

Science News Letter, October 11, 1958

EDUCATION

Cooperative Education Study to Begin

► THE FIRST nationwide study of cooperative education in American colleges and universities has been announced.

"The principal aim of the study," Dr. Ralph W. Tyler says, "is to take a careful look at the educational merits of the work-study plan for college students. We hope to learn something about . . . the outcome (of work-study programs) in terms of readiness for permanent employment and readiness for effective participation in civic and community affairs."

Dr. Tyler is chairman of the Study Committee on Cooperative Education and director of the Center for Advanced Study in the Behavioral Sciences, Palo Alto, Calif.

The study is supported by a \$95,000 grant from the Fund for the Advancement of Education, a subsidiary of the Ford Foundation.

About 60 colleges and universities have cooperative programs, under which the students alternate periods of work in school and in industry as a regular part of their degree curriculums.

Science News Letter, October 11, 1958

ICE FIELDS

AERONAUTICS

New Space Agency Takes Over

► THE NEW National Aeronautics and Space Administration is officially "in business."

The transfer of personnel, facilities and research activities to the space agency from its predecessor, the 43-year-old National Advisory Committee for Aeronautics, was announced by T. Keith Glennan, NASA administrator.

The action was nearly a month sooner than the statutory requirement that the transfer be made not later than 90 days after the enactment date of the Space Act. The act was signed by President Eisenhower July 29.

The present NACA staff numbers 8,000 engineers, scientists, technicians and other employees. Besides taking over the NACA Washington headquarters, NASA will assume the operations of the three main laboratories of the older organizations at Langley Field, Va.; Moffett Field, Calif.; and Cleveland (Lewis Flight Propulsion Laboratory). Other laboratories to come under NASA control will be the High Speed Flight Station, Edwards, Calif., Pilotless Aircraft Research Station, Wallops Island, Va., and Plum Brook Research Reactor Facility, Sandusky, Ohio.

Science News Letter, October 11, 1958

CHEMISTRY

"Tattle-Tale Gray" May Be Eliminated

► "TATTLE-TALE gray," already greatly reduced as an obstacle to sparkling white clothes, may be eliminated completely by chemists who have been studying the hows and whys of a synthetic gum used recently as a laundering aid.

Chemists assembled for the American Chemical Society meeting in Chicago generally agree that a synthetic gum, carboxymethyl cellulose (CMC), when added to detergents greatly reduces tattle-tale gray.

Tattle-tale gray is caused by laundry water dirt that is re-deposited on clothes.

Although the gum additive helps housewives and laundries, chemists have not known why or how it operates.

James W. Hensley, manager of Wyandotte Chemicals Corporation's Nucleonics Laboratory, Wyandotte, Mich., told the meeting such information could be used to improve laundry aids, and also to end a major squabble among chemists who hold different theories on the matter.

A popular theory has been that CMC coats clothing fibers during laundering and prevents soil particles from clinging to them. Attempts to test the theory have been inconclusive, Mr. Hensley said, because the

amounts of gum adsorbed, if adsorbed at all, are too small for careful measurement.

The Michigan chemist "tagged" some CMC with radioactive carbon atoms incorporated into its make-up. Routine laboratory counters enabled him and co-researcher Clyde G. Inks to make the otherwise almost impossible measurements.

They found that, although the gum was not ordinarily adsorbed on cotton fibers, it coated the fibers if detergents were present. In the case of wool and some synthetics, the gum adsorbed was less than in the case of cotton.

Careful measurements showed a definite correlation between adsorption of CMC additive and reduction of tattle-tale gray, Mr. Hensley reported.

Science News Letter, October 11, 1958

MEDICINE

Chlorophyll Compounds Show Heart-Aid Action

► CHLOROPHYLL, the substance that is indirectly responsible for sustaining all life, may prove to be life-saving.

Two classes of chlorophyll compounds have been shown to have a beneficial effect on laboratory animals with induced heart failure. The compounds are known as chlorins and rhodins.

Their effect of heart disease, which has been demonstrated many times on the hearts of frogs, rats, rabbits and dogs, was reported to the American Chemical Society meeting in Chicago by Dr. Herbert R. Wetherell Jr. of the University of Nebraska College of Medicine.

Dr. Wetherell, in reporting the studies with the chlorophyll compounds, reminded his audience of two cautioning factors: the materials are not yet ready for testing on human beings; and eating large quantities of vegetables rich in chlorophyll is not the same as treating laboratory animals with chlorophyll derivatives.

Chlorophyll is the means by which green plants manufacture carbohydrates from carbon dioxide and water with the aid of sunlight. The activity of chlorophyll derivatives on the heart has been studied for some time. Dr. Wetherell reported, "While the experiments are still a long way from clinical trials, we are nevertheless quite enthusiastic about the results."

"Digitalis, which is the drug most frequently used in heart failure," he explained, "is very satisfactory, but it must be handled with caution because of its toxic properties. Our substances appear to be relatively non-toxic, and to have them available as supplements to digitalis would be advantageous."

"We do not wish to imply that eating large quantities of vegetables rich in chlorophyll, such as spinach and beet greens, is good for one's heart. The materials we have studied are derived from chlorophyll which has been subjected to several complicated laboratory procedures."

The paper Dr. Wetherell presented to the Society was co-authored by his colleagues at the University of Nebraska College of Medicine, Drs. M. J. Hendrickson and A. R. McIntyre.

Science News Letter, October 11, 1958

MEDICINE

Cancer-Killing Antibodies Produced With Tumors

► A SUBSTANCE that kills the cancer cell from which it originated by indirectly stimulating the production of antibodies has been isolated.

The substance is extracted from mouse tumor cells and injected into rabbits. The rabbits produce the antibodies which are, in turn, injected back into the original mouse cancer cells.

These antibodies kill the cancerous growths, but not other cells, Dr. Edward C. Horn, zoologist at Duke University, reported. He has been assisted in this work by Miss Sally Grant, also of Duke, and Mrs. Mary Lee Barber, now at the University of California in Los Angeles.

"We're after the underlying principles involved in this effect, rather than the obviously clinical applications," Dr. Horn said.

The Duke University professor said that he is continuing research into the isolation of other substances in cancer cells that may give the same results.

The possibility of perfecting an anti-cancer vaccine has long stimulated research in antibody reactions of cancer cells. The first successful vaccine against cancer in mammals was the antibody produced in rabbits injected with a virus that causes a disease in mice similar to leukemia, cancer of the blood. When this antibody was mixed with the virus before injection into mice, the virus was neutralized and the disease prevented. This research was the work of Dr. Charlotte Friend of the Sloan-Kettering Institute for Cancer Research, New York.

Dr. Horn will present his findings at the American Association for the Advancement of Science meeting in Washington next December.

Science News Letter, October 11, 1958

BACTERIOLOGY

Antituberculosis Factors In Milk Studied

► AT LEAST three factors in cow's milk inhibit the growth of the tuberculosis bacterium, a team of Czechoslovakian scientists reports.

After making several tests and analyses in order to concentrate the antituberculosis substance or substances, the scientists report *Nature* (Sept. 27) that two "fat-loving" factors (lipophilic compounds that have a strong affinity for lipids or fats) and one "water-loving" (hydrophilic) factor inhibited growth of TB bacteria.

The anti-TB activities of the milk were effective in laboratory cultures of the bacterium, *Mycobacterium tuberculosis*. Previous research had shown milk inhibited the development of TB in mice.

Goat's milk and human milk also appear to have the inhibitory effect on TB bacteria's growth.

Zdenek Franc, Ivo M. Hais and Oldrich Horesovsky of the Research Institute for Pharmacy and Biochemistry, Prague, report the research.

Science News Letter, October 11, 1958

ICHTHYOLOGY

Fishy Conversations

Scientists are now eavesdropping on fishy conversations. They hope to explain why undersea creatures talk and how the talk affects other fish.

By HOWARD SIMONS

► SPINY LOBSTERS are like men, their voices become deeper as they grow older.

This is one of the preliminary findings of Dr. James M. Moulton of Bowdoin College, Brunswick, Me., who spent this summer at the Bermuda Biological Station eavesdropping on the conversations of undersea life.

In countless other marine biology stations and research laboratories throughout the world, other researchers like Dr. Moulton are studying the various aspects of the oceans. (See SNL, Oct. 4, p. 218.)

The aim is twofold:

They hope to unravel some of the mysteries of what many scientists feel is the "last frontier," the oceans.

They hope that their studies will one day provide mankind with limitless harvests that will feed an expanded population which the land will no longer be able to sustain.

Although the sea has been an integral part of mankind's history, little is actually known about the sea itself, and less about the life beneath its surface. It is only relatively recently that man has turned to the sea in an intensive effort to probe its secrets and map its nature. One of these secrets, the one Dr. Moulton is probing, is the talk between fish.

Ancient Voices

Historically, savants have, in passing, made note of the fact that beneath the surface of the sea there are fishy conversations taking place. Aristotle compared the voices of fish with those of land animals. Capt. John Smith, when he was Governor of Bermuda in the early 17th century, noted that the grouper made a sound that earned the fish its name. And, William Penn chronicled the sounds of the drum fish as early as 1685.

But it was not until the Second World War that undersea conversations by whales, lobsters, shrimp and fish earned more than passing interest. Up to this point in the history of undersea noises man had pretty much relied on a tool that was not very well-adapted to hearing under water, his ear. The advanced technology gave him a new tool: electronic gear that could detect the screws of an enemy's propeller or the echo from a submarine's hull.

As often happens, the new tool carried along with its new problems. Submariners of both the Allied and Axis fleets were plagued with reports of enemy craft in the vicinity, only to learn that there were no craft. Research since has implicated a host of undersea life as the culprits in the deadly hide-and-seek game of ferreting out enemies

while blinded beneath tons of water. The problem still exists.

The sounds emitted by fish and other marine animals plagued landlubbers too. The harbor defense forces in Chesapeake Bay, for example, were being alerted frequently until it was learned that they were responding to the calling of thousands of drums or croakers moving into the Bay each spring to breed.

Finally, it was found that a single call of a common toadfish was intense enough to trigger an acoustical mine that was meant to be tripped by the sound of a passing ship.

Dr. Moulton is interested in these more practical problems of undersea talk because he is interested in all its aspects. But his primary work is basic research. He wants to try to learn why crustacea and undersea mammals and fish talk. Who do they talk to? What effect does the fish conversation have on the behavior of other fish? How do they talk? How do they listen?

Dr. Moulton's research along the Atlantic Coast from Maine to Bermuda, together with that of other investigators, is only now

beginning to nibble away at the mysterious bait of fish talk.

For example, Dr. Moulton explains, not all fish talk as much as others. Curiously, it is found, sound production is more widespread among salt water fishes than fresh water fishes. Similarly, another scientific enigma is the fact that fishes living in clear, warm seas such as around Bermuda seem to have evolved a greater variety of sound-producing mechanisms than have fishes in Dr. Moulton's home territory of cold northern waters.

What does the talk sound like? Jacks and grunts, which produce sound by rubbing teeth or other skeletal parts of their body together, sound like the "noisy eating of celery," Dr. Moulton says.

"The toothplate rubbing of puffers and porcupine fishes produces a sound similar to that of a klaxon horn."

The tiny snapping shrimp, one to three inches long, literally snaps a single oversized claw. Together, several of the small shrimp sound like "fat frying."

The spiny lobster makes two sounds: a rasp when it is disturbed or injured; and a "rattle" during the daytime only, when it is unperturbed. At night, the lobster is quiet, although more active.

Why undersea creatures talk is very much a mystery. Dr. Moulton, and others, have speculated heavily and their theories run the gamut from sound produced for defensive purposes to mating calls. All or none may be true.

Sea Robins' Song

Sea robins, Dr. Moulton points out, have been shown to respond to imitations of their staccato calls played back to them underwater. Male gobies, some drums and cods all develop a call during the breeding season which, when played into the water, stirs females in captivity.

Squirrel fish and grouper of the Great Bahama Bank, Dr. Moulton says, "bark at an approaching hydrophone much the same as a dog will bark at an approaching automobile."

"The black angelfish of the same waters incorporates a whining call into recognition behavior toward an approaching member of the same species."

Other fish grunt at signs of danger. Still others moan when protecting their nests. The list of sounds and reasons for them seem almost as inexhaustible as the numbers of fish in the oceans.

Dr. Moulton believes from his own work and that of others, that "many fishes create sounds as integral parts of their normal behavior patterns and it is probable that at least in many instances the sounds may serve to facilitate breeding." This aspect of fish talk may prove to be a key to harvesting the seas to feed future generations.

Looking to the future, Dr. Moulton says: "Much remains to be done in studying



THIS LOBSTER RASPS—This Bermuda spiny lobster talks, and what is more, its voice gets deeper as it grows older. The lobster is being held by Dr. James M. Moulton of Bowdoin College, Brunswick, Me., a scientist who listens in on undersea conversations. He has been eavesdropping in the waters surrounding Bermuda while doing research at the Bermuda Biological Station.

the relations of sound production and sound detection to the animals of the sea. It may be that someday introduction of appropriate sounds into the sea may serve to increase the catches of commercial fishermen, and to conserve valuable fish populations by driving them around obstacles or areas unfavorable to their survival."

To pursue his aim that one day might spell increased harvests of the sea, Dr. Moulton uses many avenues of attack. At the Bermuda Biological Station, for example, he takes a small boat out into the cool blue waters surrounding the Islands and drops a hydrophone overboard to listen in on the talk below. At the same time, every grunt and groan is being recorded on tape. The Maine scientist has become so adept at his eavesdropping that he has little or no trouble identifying many of Bermuda's fish from what he hears, but cannot always see.

He may repeat his eavesdropping off a dock at night, or in the tanks at the Station to learn what effect captivity has on sound production. At other times he dissects fish to learn the structure of their sound-producing mechanisms, as well as their hearing aids.

Fish, he explains, have ears that are much like those of humans. They have adapted them, however, to their specific purposes and there appear to be almost as many variations as there are species of fish. If one wonders why he has never seen an ear on a fish it is because fish lack both the external and middle ears of humans. They also lack man's most important sound receiving instrument, the long, coiled cochlea of the inner ear.

"Hearing" Without Ears

Crustacea, such as lobsters and shrimp, on the other hand, have no ears. It has been postulated that they "hear" by picking up vibrations through any solids that they walk on.

Some fish, Dr. Moulton points out, hear over a frequency range comparable to that of humans, but the upper limit does not exceed about 13,000 cycles per second. It has yet to be demonstrated that a fish can hear in the upper adult human reaches of about 17,000 cycles per second.

To complicate an already complicated mystery, Dr. Moulton states, there are other factors that must be considered. One of these is known as the lateral line system. All fish have tiny receptors either on the surface of their bodies or close to the surface. The lateral line system is connected to the fishes' ears, and is sensitive to low frequency sounds. The role of these pressure receptors that usually run in a lateral line along each side of the fishes' bodies remains unsolved.

Listening to fish talk is not the work of scientists alone. Professional fishermen throughout the world are just as aware of undersea conversations as are Dr. Moulton and his colleagues.

Dr. Moulton, whose work is supported by a grant from the National Science Foundation and who is on the staff of the Woods Hole Oceanographic Institute, seems to be

(Continued on page 238)

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALL ABOUT ANIMALS AND THEIR YOUNG—Robert M. McClung—*Random House*, 148 p., illus. by author, \$1.95. Scientific facts presented in simple language for the young reader.

ANCIENT ELEPHANTS—E. Scheele—*World Pub Co.*, 64 p., illus. by author, \$2.50. About mastodons and mammoths, for young readers.

APPLICATION OF ATOMIC ENGINES IN AVIATION—G. N. Nesterenko, A. I. Sobolev and Yu. N. Sushkov, in English translation—*Office of Technical Services*, 184 p., illus., paper, \$3. Published by the Military Press of the Soviet Defense Ministry in 1957.

BEHIND THE SCENES AT AN AIRPORT—David C. Cooke—*Dodd*, 64 p., illus., \$2.25.

THE BIRDS—Oskar Heinroth and Katharina Heinroth, transl. from German by Michael Cullen—*Univ. of Mich. Press*, 181 p., illus., \$5. Written in simple language, it reflects a profound scientific knowledge about birds.

CONFERENCE ON HEMOGLOBIN—Frank M. Holz and James R. Weisger, Eds.—*Nat. Acad. of Sciences-Nat. Res. Council*, Publication 557, 303 p., illus., \$3.

COSMOPOLITAN WORLD ATLAS—*Rand McNally*, 202 p. of maps, 174 p. index, \$13.95. Features include: Wall map of Alaska, full-color topographic maps, world areas in true proportion.

DIFFERENTIAL CALCULUS—P. J. Hilton—*Free Press*, 56 p., paper, \$1.25.

EBB AND FLOW: The Tides of Earth, Air, and Water—Albert Defant, transl. from German by A. J. Pomerans—*Univ. of Mich. Press*, 121 p., illus., \$4. What tides are, how they work, and why.

ELECTRONICS OF MICROWAVE TUBES—W. J. Kleen, transl. from German by P. A. Lindsay, A. Reddish and C. R. Russell—*Academic*, 349 p., illus., \$9. New material added since first German edition in 1952.

ELEMENTARY DIFFERENTIAL EQUATIONS & OPERATORS—G. E. H. Reuter—*Free Press*, 67 p., paper, \$1.25.

FELLOWSHIP SELECTION RESEARCH—A Four-Year Progress Report—Lindsey R. Harmon—*Nat. Acad. of Sciences-Nat. Res. Council*, 37 p., paper, \$1. Brief historical sketch and evaluation of techniques.

FIRST SCIENTIST OF ALASKA: William Healey Dall—Edward A. Herron—*Messner*, 192 p., \$2.95. Biography of the naturalist whose ma-

rine, botanical and geological specimens can be seen at the Smithsonian.

HANDBOOK OF PHYSICS—E. U. Condon and Hugh Odishaw, Eds.—*McGraw*, 1504 p., illus., \$25. One-volume compendium of "what every physicist should know," recognizing the difficulty of the physicist to be really well-informed on more than a narrow specialty.

THE HANGOVER: A Critical Study in the Psychodynamics of Alcoholism—Benjamin Karpman—*Thomas, C. C.*, 531 p., illus. by Wesley R. Wilken, \$9.50. A study of the mental life of alcoholics.

HOW TO SUPERVISE PEOPLE—Alfred M. Cooper—*McGraw*, 4th ed., 250 p., \$4.95. For industrial supervisors, brought up-to-date.

JOHN WESLEY POWELL: Geologist-Explorer—Dale White—*Messner*, 192 p., \$2.95. Biography for teen-agers.

KANGAROOS: And Other Animals with Pockets—Louis Darling—*Morrow*, 64 p., illus. by author, \$2.50. Interesting facts about the marsupials of Australia, for young readers.

LINEAR EQUATIONS—P. M. Cohn—*Free Press*, 74 p., paper, \$1.25.

LOOKING AT CHROMOSOMES—John McLeish and Brian Snood—*St. Martins*, 87 p., illus., \$3.75. The behavior of cells and the hereditary substances they contain is told in a continuous series of photographs and drawings.

NUCLEAR ENERGY AND WORLD FUEL PRICES—Cornelius J. Dwyer—*Nat. Planning Ass'n*, 74 p., paper, \$1.25.

NUTRITION FOR YOU—Robert S. Goodhart, foreword by Norman Jolliffe—*Dutton*, 215 p., \$4.50. Compact summary of latest information.

ORPHAN: A Raccoon—Era Zistel—*Rand McNally*, 80 p., illus. by Seymour Fleishman, \$2.50. Story of a raccoon who came to live with a family.

A PARENT'S GUIDE TO CHILDREN'S READING—Nancy Larrick—*Doubleday*, 283 p., illus., \$2.95; *Pocket Bks.*, 258 p., illus., paper, 35¢. Parents of pre-school and elementary school boys and girls are told how to select and introduce books to children, and how to help them increase reading skill.

THE PLASMA IN A MAGNETIC FIELD: A Symposium on Magnetohydrodynamics—Rolf K. M. Landshoff, Ed.—*Stanford Univ. Press*, 130 p., illus., \$4.50.

SCIENCE: Who Gets What Science News; The News: Where They Get It and What They Think About It; THE PUBLIC—Hillier Kriehbaum—*N. Y. Univ. Press*, 43 p., illus., paper, \$1. A Report of The National Association of Science Writers.

SEQUENCES AND SERIES—J. A. Green—*Free Press*, 78 p., paper, \$1.25.

SPACE EXPLORATION—Patrick Moore, Ed.—*Cambridge Univ. Press* for National Book League, 36 p., paper, 75¢. Bibliography on astronomy and astronautics for teen-agers and adults.

THE STRUCTURE OF GLASS: Proceedings of Leningrad Conference, 1953—K. S. Evstropiev and others, introd. by A. A. Lebedev, transl. from Russian by E. B. Uvarov—*Consultants Bureau*, 295 p., illus., \$2.00.

WILL MY BABY BE BORN NORMAL?—Joan Gould—*Public Affairs Committee*, Pamphlet No. 272, 20 p., illus., paper, 25¢.

Science News Letter, October 11, 1958

ADVENTURE — RESEARCH — EXPLORATION for young people



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and how to help them... why 5,000 \$5 bills were stuffed into our till

Be creative, if you insist

Persons who deplore photography as mechanistic submergence of the human spirit may, if they wish, go on sketching anatomical specimens with a charcoal pencil and then retire to the library to enjoy their personal collections of authenticated original Botticellis. But here's the dope on the new *Kodacolor 135 Film* for miniature cameras—in case you prefer photography. It is the first Kodak color film expressly made for obtaining color prints with a 35mm camera.

You bring your exposed film to your dealer. He sends it to a color processor—of which gentry Kodak is one. Kodak provides $2\frac{1}{2} \times 3\frac{1}{2}$ -inch enlargements (2X from the 35mm negative) at 23¢ each list, or $3\frac{1}{2} \times 5$'s (3X) at 32¢ list. To compensate for numerous unknowns along the way, we have to exercise (electronically) for each negative an individual judgment of the color balance you would like. By dint of intensive studies employing techniques of experimental psychology and statistical analysis and by further dint of having made quite a pile of satisfactory prints already, we generally hit it right.

If your subject is a paint sample before and after fading instead of someone's blond granddaughter in front of a rose arbor and you're going to a color lab for a custom job, it wouldn't be a bad idea to include a neutral grey card outside the area of interest in the original picture. If you ask to have the grey card rendered as grey and then cropped off, no color processor can go far off faithful color rendition of your subject.

You have an alternative to color lab processing, of course. For 75¢ a Kodak dealer will sell you a copy of the brand new Kodak Data Book, "Printing Color Negatives." You can study that and then make your own prints and your own decisions, using the right Kodak chemicals and *Kodak Ektacolor Paper* (formerly called Kodak Color Print Material, Type C).

Try it. During that first night in the darkroom the human spirit will find plenty to keep it occupied.

A talisman from New Haven

We manufacture 16mm motion picture projectors and film. The projectors are sold by audio-visual dealers, to be found in many cities. The film is purchased by motion

picture producers, who place suitable images on it, so that there shall be some further purpose served by running it through the projectors sold by the audio-visual dealers. Our intentions are direct and praiseworthy. We want large numbers of persons to visit the audio-visual dealers, to discuss with them such matters as the advantage of a 25-watt amplifier over a 15-watt amplifier, and to conclude each such visit with a substantial order for each of the four current models of *Kodak Pageant Sound Projectors*. We also want a large increase in the number of new 16mm films produced. At latest count, only 77 new films were being professionally produced in the United States each day.

Finding ourselves in mid-20th century, we have to proceed toward these simple objectives by sophisticated routes. We use more than mere words for persuasion. We employ graphic communication. From the Yale News Bureau, we acquire a photograph of their serene campus.



We assure the Bureau that no endorsement of us or our works is to be implied. The photograph serves only as a visual symbol of scientific objectivity.

Next we establish why we picture Yale instead of some other equally serene haven of objectivity. Yale was the site of two important conferences at which learned psychologists and successful communicators met and scrutinized the obstacles to wider and wiser use of films, slides, sound filmstrips, etc., in conveying information, skills, or attitudes from one group of heads to another.* A second Yale angle is that two of its professors of psychology have prepared a scholarly evaluation of scientific principles

*The obstacles haven't been too bad, mind you. The nation's schools manage to keep 171,000 16mm projectors busy, while the churches and their affiliates operate another 90,000. Business firms own almost as many as the schools. Over 3500 companies and trade associations currently sponsor one or more of their own 16mm movies. Eager to get them are the program chairmen of the estimated 1,000,000 groups in the U.S.A. that have 50 or more members and meet regularly. That's a lot of P-T.A.

for maximum learning from motion pictures and other audio-visual media. In the native patois of their discipline they say that movies are fine for teaching and suggest lines of research on how to improve them even further than they have already been improved by all the research they cite.

Their views and those of the conferees are given in a book entitled "Graphic Communication—and the Crisis in Education," obtainable from the Department of Audio-Visual Instruction of the National Education Association, 1201 16th Street, N.W., Washington 6, D.C. We suggest the hard-cover edition of \$2. It makes just the right noise when slapped down at the opposite end of the table from any finance committee member who insists on something scientific that he can take home in his briefcase.

The stickum of last resort

For *Eastman 910 Adhesive*, of which the active ingredient is methyl-2-cyanoacrylate, we now have a slogan—"the adhesive to try if no other will do."

We are just being sensible. Its price by the ounce is \$10; special pound price, \$75. It *does* make possible some distinctly advantageous new assembly techniques in a large number of industries. So we gather from the correspondence incidental to the 5,000 orders filled during the past year. It bonds virtually everything (except silicones and polyolefins, else how could we deliver it?).

The biggest plus is the speed at which enormous bond strength is developed within minutes after application of this thin, clear liquid to one of the adherents. Within hours the tensile strength of its bond to steel is in the thousands of pounds per square inch. In the case of glass, rubber, or wood, bonds are stronger than the material itself. There is virtually no shrinkage on setting. No heating, no great squeezing, no evaporation is required. The bond, however, should not be depended on for too many weeks at temperatures above 175°F, particularly in the presence of much moisture. That's the minus.

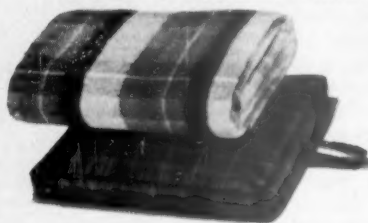
In case *Eastman 910 Adhesive* sounds more interesting now than it did when we practically swamped our boat by offering samples at \$5 an ounce, write to *Eastman Chemical Products, Inc.*, Department E910A, Kingsport, Tenn. (Subsidiary of *Eastman Kodak Company*).

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Questions

ASTRONAUTICS—What are the names of three new international cooperative groups expected to begin work soon? p. 227.

ICHTHYOLOGY—How do some species of shrimp talk? p. 234.

ROENTGENOLOGY—What drug has been used to stop the heart's action momentarily? p. 230.

Photographs: Cover, and p. 227, U. S. Weather Bureau; p. 229, Bell Telephone Laboratories; p. 231, Bendix Aviation Corporation; p. 234, Bermuda News Bureau; p. 240, Eastman Chemical Products, Inc.

Fishy Conversations

(from page 235).

as much an historian of fish talk as he is a researcher. For some years now he has collected bits and pieces of information as to how professional fishermen use fish sounds and fish hearing to increase their catches. Most of what he has learned points up a timeless trial and error method of various peoples to use fish talk as bait.

Syrian fishing boat crews station a crew member in the hull to detect the resonance of a certain category of sounds that they associate with a particular bottom configuration over which fishes feed in large numbers.

Japanese fishermen have long associated the croaking of certain kinds of marine fishes with a good fishing season. Okinawan fishermen use scare ropes and sound tubs. English fishermen in Robin Hood's Bay thrash the water to scare the fish into shallow water. In Borneo fishermen use coconut rattles. In the United States menhaden and herring fishermen bang their boats.

"Fish listening reaches its highest refinement perhaps," Dr. Moulton says, "on the east coast of Malaya where specially trained leaders of fishing crews submerge their whole bodies in the water to listen for sounds that will guide the placing of nets. These fish listeners are trained in their art for years."

Today, he points out, Canadian and U. S. Fish and Wildlife investigators are interested in listening on the Grand Banks for seasonal sound production of cod and haddock as an indication of population density.

It appears that the voices of talking fish may soon be heard more loudly than ever before.

Science News Letter, October 11, 1958

Do You Know?

Anoxia, or lack of oxygen, is generally believed to be an underlying factor in cerebral palsy.

The earth's polar motion, or free nutation, akin to the wobbly motion of a spinning top, creates its own ocean tides.



TEST YOUR GULLIBILITY

How many of these items do you believe?

1. ITEM. The Mona Lisa in the Louvre is a fake; the real Mona Lisa is owned by a Texas oilman, who purchased it from the forger who made a substitution . . .
2. ITEM. In 1933, a 300-foot monster was discovered in Loch Ness, in Scotland . . .
3. ITEM. On the anniversary of the death of Rudolf Valentino, a mysterious "Lady in Black" appeared at Valentino's tomb . . .
4. ITEM. During Prohibition, a 17,000-ton Floating Cafe anchored 15 miles off Fire Island for "wet" New Yorkers . . .
5. ITEM. The bathtub was first introduced to America in 1842; it was denounced by physicians, and when Fillmore installed the first tub in the White House he caused a scandal . . .

Each one of these items is a hoax, dreamed up by bored newspapermen, clever press agents, and pranksters. They have been among the most successful ever perpetrated. The bathtub hoax, which the late H. L. Mencken created, is still current.

HOAXES by Dr. Curtis MacDougall, Professor of Journalism at Northwestern University, examines some 300 such hoaxes in science, art, medicine, journalism, etc. He tells about hoaxes of the past: the Cardiff giant, Ireland Shakespear forgeries, Cagliostro, Piltown man, Herschel's observations of intelligent life on the moon, and scores of others. He also describes the careers of amateur hoaxsters like W. H. D. Cole, whose life is more fascinating than most novels, and professionals, like Harry Reichelbach, who publicized the Tarzan pictures by releasing a chimpanzee dressed in an evening suit in a hotel lobby, pushed Tribby by having girls fall into hypnotic trances. **HOAXES** is not only delightful entertainment, but a work of scholarly value that will enlighten you about many things you've probably believed.

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❁ **FRI-DRI**, made from perforated stainless steel, is used to strain grease from foods while over heat. It can also be used as a drainer on saucepans. The gadget can be clamped to cooking utensils from 7 inches to 11 inches in diameter.

Science News Letter, October 11, 1958

❁ **PHOTOGRAPH ENLARGER CONTROL** automatically figures the diaphragm aperture. The control is adjusted to the speed of the photographic paper. Then an image of the negative is projected onto a photo-electric cell. The diaphragm opening is indicated on a so-called "magic lamp."

Science News Letter, October 11, 1958

❁ **PLASTIC FOAM WEATHERSTRIPPING** with self-adhesive backing has many household uses. Besides its weatherstripping function, it is used as insulation on refrigerator and freezer doors. It also reduces vibration of electrical appliances when applied to their bases.

Science News Letter, October 11, 1958

❁ **HOLLOW BARBELLS**, shown in the photograph, made of a polyethylene are filled with water or sand to adjust their weights. For use by children, the weights



can be varied between two pounds and 20 pounds. The bar is made of aluminum.

Science News Letter, October 11, 1958

❁ **AIR-CONDITIONED RUBBER BOOTS** produce a bellows-like action with every step. Ridges molded inside the all-rubber, unlined boot direct the ventilation

and circulation of air. The boots also come in neoprene, a synthetic rubber, for heavy-duty wear.

Science News Letter, October 11, 1958

❁ **MOBILE POWER CONVERTER** is installed in cars, trucks, boats or planes. There are models for 6-volt and 12-volt batteries. The device converts direct current into 110-volt, 60-cycle alternating current for operating various electrical appliances from a car battery.

Science News Letter, October 11, 1958

❁ **TELESCOPE CAMERA** for taking pictures of the moon and stars and long-distance terrestrial objects fits onto standard telescopes. It uses sheet film. The German-made shutter has nine speeds between "time" and 1/200 of a second.

Science News Letter, October 11, 1958

❁ **TWO-STAGE TOY ROCKET**, made of plastic, operates on water and air. After partial filling with water (soda water gives more push), air is added with a hand pump, included in the set. The first stage lifts the rocket to about 250 feet. The second stage is automatically released and climbs up still higher.

Science News Letter, October 11, 1958



Nature Ramblings



By HORACE LOFTIN

► **OFTEN WHEN** an American hunter pulls the trigger, he contributes to the preservation of the game species which he hunts. And when a fisherman buys a new plug to pull a bass out of the water, he may be helping the nation's population of sports fishes in a generous manner.

The sportsman may not be consciously aware of his contribution to good fish and wildlife conservation, but thanks to two very wise and farsighted Federal laws, he cannot help but aid the nation's game and game habitats.

The two laws involved are the Pittman-Robertson (P-R) and the Dingell-Johnson (D-J) Acts, known jointly as the "Federal Aid in Fish and Wildlife Restoration" acts.

These laws provide for a sizable excise tax on all guns and ammunition and on fishing tackle, which expense is passed on to the hunters and fishermen who benefit most directly from its use. The money is then

Helping Our Wildlife



made available to the wildlife divisions of the state governments, for exclusive use in management and research on fish and game.

During 1957, the states and territories received some \$16,000,000 from P-R funds and \$5,000,000 from D-J funds, for their work on fish and game conservation. The states put up an additional one-quarter of this amount as required matching funds. With this income, 1957 proved to be one

of the most successful years in fish and game management and research on record.

In the period before P-R and D-J funds, the various states had to depend almost entirely on revenue from the sale of hunting and fishing licenses for all of the activities of the conservation agencies. By the time that law enforcement, administration, managed game hunts, and a multitude of other necessary functions were provided for, there was far too little left for effective management work.

With a growing number of hunters (more than doubling since the end of World War II) and decreasing fish and game habitats, the management problem was acute. Not only hunting and fishing, but all phases of conservation of our natural resources were beginning to suffer.

It was in the face of this alarming situation that Congress passed the P-R and D-J acts, acts which now rank among the most important conservation measures of the century.

Science News Letter, October 11, 1958

